Analysis of DNA and Protein Adducts of Benzo[*a*]pyrene in Human Tissues Using Structure-Specific Methods: A Literature Review.

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In this presentation, we will review studies which investigate the presence of DNA or protein adducts of the carcinogen benzo[*a*]pyrene (BaP) in human tissues, using structure-specific analytical methods. The analytical methods include high performance liquid chromatography with fluorescence detection and gas chromatography-mass spectrometry. Virtually all studies measured BaP-tetraols released from DNA or protein by hydrolysis of adducts derived from the 7,8-diol-9,10-epoxide metabolite of BaP. DNA adducts of BaP were detected in 44% of 659 samples analyzed. Protein adducts of BaP were detected in 59% of 886 samples. There was no single exposure situation that led to an overwhelming presence of detectable adducts. For example, DNA adducts of BaP were detected in 50% of smokers, 46% of former smokers, 52% of non-smokers, 39% of occupationally exposed individuals, and 33% of environmentally exposed people. It is often written that mutations in the *p53* tumor suppressor gene in human lung tumors result from BaP-DNA adducts, but our results indicate that these adducts are frequently not detectable, even in smokers. Therefore, the presence of BaP adducts cannot be assumed, even in situations where exposure to BaP is relatively high.